

Amendments to the Drawings

Applicants are herein amending FIG. 1. During filing, Applicants submitted FIG. 1 with text that read "*Tier I*" instead of "*Tier I'*", which is referred to in the specification, as already admitted by the Office. Emphasis added. Applicants are herein submitting a corrected FIG. 1 to correct this minor informality, and as directed by the Office. A replacement sheet is herein submitted with an annotated sheet showing the changes made. No new matter is added. Entry of the amendment of FIG. 1 is requested.

Attachment: Replacement Sheet

Annotated Marked-Up Drawings

REMARKS

Claims 1 through 20 are presented in the instant patent application. Claims 1, 8, and 15 are the independent claims. Claims 2 through 7 depend from Claim 1. Claims 9 through 14 depend from independent Claim 8. New Claims 16 through 20 depend from Claim 15.

1. Objection to Oath/Declaration

The Office objects to the oath or declaration as the executed documents do not correctly identify the citizenship of the third inventor. The Office states at page 2 of the Action that a new oath or declaration are required. Applicants herein submit a new executed supplemental declaration with the instant Amendment. Applicants herein state that this citizenship information was accidentally left off of the original declaration without deceptive intent. Acceptance of the supplemental declaration is respectfully requested.

2. Objection to FIG. 1 of the Drawings

In the application, Applicants incorrectly submitted FIG. 1 with text that read “Tier 1” instead of “Tier I”. The Office rejected FIG. 1, and has requested a replacement sheet. Applicants are herein submitting a corrected FIG. 1 to correct this minor informality. No new matter is added by the amendment, and reconsideration and withdrawal of the objection are respectfully requested.

3. Objection to the Specification

At page 3 of the Action, the Office objects to the specification, as the specification includes a minor typographical error, and also does not properly capitalize the names of trademarks in various locations of the specification, such as, for example, ORACLE®. Applicants herein amend the specification to correct the objectionable typographical errors, and also are amending specification pages to capitalize the trademarked names used in the course of the patent application.

No new matter is added. Reconsideration and withdrawal of the objection are respectfully requested.

4. Rejections under 35 U.S.C. § 112, second paragraph

In the Action at page 6, Claims 1 through 7, 10, and 12 through 14 are rejected under 35 U.S.C. § 112, second paragraph as failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. Specifically, Claim 1 is rejected as there is insufficient antecedent basis for the limitations “composite class views”, and “tier results”. In the Action, Claims 1 and 2 are also rejected as having insufficient antecedent basis for “class views”.

Applicants have corrected the antecedent basis of the elements of Claim 1, so the claim is clear, definite, and includes the proper antecedent basis. Reconsideration and withdrawal of the §112 rejection are respectfully requested. Claims 2 through 7, which depend from Claim 1 are, thus, now also clear, and definite as they depend from Claim 1.

In the Action, the Office alleges that the limitation of “the attribute” in Claims 3 and 10 lack antecedent basis. Applicants are amending the objectionable limitation to “the attribute in the composite class view”. No new matter is added. Reconsideration and withdrawal of the indefiniteness rejection are respectfully requested.

Claims 7, and 14 recite the limitation of “XML”. Although, Applicants respectfully contend that this claim limitation is clear and definite, and was understood by the Office in the Action, Applicants in order to advance the prosecution and an allowance of these claims are amending the element as suggested by the Examiner. Applicants thank that Examiner for the suggested language.

In Claim 12, the Office objects to the limitation of “a core model”. In response, Applicants are herein amending the claim to recite “the core conceptual data model,” proper antecedent basis of which is found at line 10 of base Claim 8. As now amended, Claim 12 is clear and definite in satisfaction of the requisites of 35 U.S.C. § 112. Claims 13 and 14 depend from Claim 12, and are also now rendered definite by this Amendment.

5. **Rejections under 35 U.S.C. § 101**

In the Action, Claims 1 through 15 are rejected under 35 U.S.C. § 101. The claims are rejected since the invention is supposedly directed to a computer apparatus of functional descriptive material, *per se*, and is therefore alleged to be non-statutory.

Applicants' claims, as now amended, are directed to a computer apparatus for managing and sharing engineering data for chemical engineering processes and plants, as well as to a computer program product for managing engineering data and plants, and a computer implemented method.

The claimed method, apparatus and computer program product recite computer components that define structural and functional interrelationships between elements that permit the apparatus/computer program functionality to be realized. Included are an editor (defining class views and a composite class view), a data server, and a multi-tiered data model. In the multi-tiered data model, there is a conceptual data model having a plurality of routes between attributes in the composite class view and attributes in the core conceptual data model. The class views are effectively one tier in the multi-tier data model, while the composite class view is effectively a second tier, and the core conceptual data model is effectively a third tier.

Further, the multi-tier data model is recited as having links between corresponding attributes across tiers, which provide a real and tangible result, in that the multi-tier data model provides management and sharing of engineering data of the given software applications with other process and plant engineering applications. Such enhances process engineering, control, and plant operations.

In addition, as pointed out more particularly in the patent application, as originally filed, at page 13, lines 21 through 26, the present invention provides for ways to provide enhanced system control over process and plant engineering routines. This method and apparatus as defined in Claims 1-15 enables sharing of data through interfaces that permit operation of the multi-tier data model, and that permit operation of the subject program or software applications. This, in turn, has the advantage of providing precision control of a physical plant, while keeping these sets of programs separate in a multi-tiered manner for modeling. Thus, not only does the claimed invention provide a concrete and tangible result, it provides an advantage over other ways of

modeling behavior. This advantage is also an additional concrete and tangible result, which is not disclosed in the prior art.

For the foregoing reasons, Claims 1-15 as now amended are believed to be directed to statutory subject matter. Thus, reconsideration and withdrawal of the 35 U.S.C. § 101 rejection of Claims 1-15 are respectfully requested.

6. Rejections under 35 U.S.C. § 102(e)

Claims 1-6, 8-13, and 15 are rejected in the Action under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 7,047,518 B2 to Little *et al.*, (hereinafter “Little”). In response, Applicants respectfully traverse the rejection as Little does not disclose or suggest all of the elements of the independent claims.

Little discloses a system for software application development and modeling. Little discloses a system that automatically generates software code in accordance with some preset wishes of the software developer. See Little at Column 1, lines 53 through 63. Little also discloses using modeling tools, such as, a Unified Modeling Language, or a non-proprietary language, which provides software architects with a standardized language for specifying, constructing, visualizing, and documenting the artifacts of a complex software system. See Little at Column 2, lines 10 through 23. Little also discloses a modeling development system which uses UML object modeling. See Column 11, lines 23 through 45.

By way of background, the Unified Modeling Language (hereinafter “UML”) is a standard language for specifying, visualizing, constructing, and documenting the artifacts of software systems, as well as for business modeling and other non-software systems, and uses mostly graphical notations to express the design of software projects. Using the UML helps project teams communicate, explore potential designs, and validate the architectural design of the software project.

Little discloses creating a data entity framework at step 302 of FIG. 14. The data entity groups are created using an Expert System menu option (step 304). These data entity groups create a set of relational tables and relational view classes, which represent RDBMS tables, and views and customized definitions. See Column 16, line 55 through Column 17, line 13.

Next at step 306, customized access classes are created in FIG. 14. Here, the programmer creates relational table classes and a class diagram to show the relationship between classes. Next, a composite view class is created at step 308. Here, dependent relationships values are established between multiple tables. See Column 17, line 25 through line 36.

For every relational table, view, or composite class in Little, a data entity package is created in the program, and which maps to the relational table and the relational view class (Step 312). See Column 18, lines 6 through 26. Finally, at Column 19, lines 16 through 31, Little discloses that a code generation is conducted, which prepares the model for implementation. This creates data groups for a component view, and all details, such as, physical source files, make files, and libraries, are populated in all corresponding model components.

Once the modeling is complete in Little, the programmer generates the data access code for the application, and a number of directories for this code are created. Generation of data access C++ source files, are then made. See Column 19, line 27 through 31.

Little does not disclose or suggest a computer apparatus that includes (i) a composite class view formed by a consolidation of class views, (ii) a core conceptual data model having a plurality of routes between attributes in the composite class view and attributes in the conceptual data model, and (iii) a multi-tier data model with the class views effectively being one tier, the composite class view effectively being a second tier and the core conceptual data model effectively being a third tier.

Applicants' synthesis or consolidation of the Class Views 20 results in the creation of the Composite Class View, which is an amalgamation and rationalization of the individual class views 20, and the Class Views remain in the application domain terminology. See Applicants' specification at page 8, lines 1 through 4.

Contrast this with Little at step 308 of FIG. 14, and at Column 17, lines 25 through 36, which uses UML or a general purpose modeling language that includes a graphical notation that is used to create not a multi-tiered model, or any 'consolidated' composite class view, but instead an abstract model of the system, as shown in the multiple table operation at lines 23 through 36, or creates an "enhanced design UML model". See Little at Column 30, lines 66 through 67.

Contrast again, this graphical enhanced UML notation with Applicants' system where a data server 60 can instantiate data objects 12 and expose these objects through interfaces following the

class and other views 20, 30, and 40 defined by class editor 55. This combined system (data server and class editor) enables the sharing of original application data with process plant engineering routines and programs.

The foregoing patentable distinctions are recited in base Claims 1, 8 and 15 with the claim terms (or similar language)

“... an editor defining (i) class views and (ii) a composite class view of the defined class views...”

the editor consolidating said class views to form a composite class view....

a data server instantiating a multi-tier data model, there being a core conceptual data model having a plurality of routes between attributes in the composite class views and attributes in the core conceptual data model...

the multi-tier data model providing . . . sharing of engineering data of the given software applications with other processes and plant engineering applications, and enhancing process engineering and plant operations”.

Support for claim amendments highlighting these patentable distinctions is found in various portions of the specification, for example at page 10 lines 20-21, page 11, line 24 through page 12 line 3, page 13 lines 6-26 and Figs. 6 through 8. No new matter has been introduced.

Claims 2 through 6 are also patentable as these claims depend from Claim 1. Independent Claims 8, and 15 are patentable for reasons similar to those argued above for Claim 1. Claims 9 through 13 are also patentable as these claims depend from independent Claim 8.

Accordingly, the 35 U.S.C. § 102 rejection of Claims 1 through 6, and 8 through 13, and 15 is believed to be overcome, and withdrawal of this rejection is respectfully requested.

7. Rejections under 35 U.S.C. § 103(a)

In the Action, Claims 7, and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable as obvious over Little. Applicants traverse the rejection, and state that one of ordinary skill in the art would not be motivated to modify the primary reference as indicated by the Office at page 19 of the Action. Specifically, the Office states that “Official Notice is taken that it is old, and well known in the computing art to utilize XML.”

Applicants contend that one of ordinary skill in the art having Little hypothetically would not have provided the claimed class editor employing an Extensible Markup Language.

Little discloses using a UML language to graphically represent data, and to create an enhanced UML model from the data. This does not create a multi-tiered data model for sharing engineering data between subject software applications and chemical or process plant applications as in Applicants' claimed system. As mentioned in Column 17 of Little, Little discloses using a UML dependency, or a standard language for specifying artifacts of a system using graphical notations to represent a relationship between a class, and a relational table class at step 308. Applicants' system is superior as the attributes in the Class views remain in the subject software application domain terminology. This permits an accumulation of operating procedures, knowledge about best operating conditions, performance, maintenance procedures, and other information to the model, while allowing the software applications to normally operate in a three-tiered system.

Moreover, Applicants rebut the contentions of the Office in that one would substitute portions of the UML model to use XML since, the whole point of Little's system is to use a freely available UML open source or freeware graphical modelling language that includes graphical notations to set relationships between groups of data to avoid a software engineer or software designer actually writing the software code. One of ordinary skill in the art would not attempt to edit in Little using XML interfaces or provide a class editing subsystem that employs an Extensible Markup Language for the UML graphical notations. The whole point of using an open source UML graphical system is to avoid drafting such code or employing such XML interfaces. These two concepts teach away from one another, which is a strong presumption in favor of patentability of Claims 7 and 14.

Moreover, Applicants are not aware of any systems that employ XML for model editors and ask the Office to provide such references to rebut the Office's contention that this is known.

Applicants believe that base Claims 1 and 8 are patentable over Little as argued above. Claim 7 depends from Claim 1, and Claim 14 depends from Claim 8, and thus, these claims are patentable for at least the reasons discussed above for the base claims from which they depend. As such, the 35 U.S.C § 103(a) rejections of Claims 7 and 14 are believed to be overcome and should be withdrawn. Reconsideration and withdrawal of the rejection are earnestly solicited.

8. **Newly added Claims**

Applicants have added new Claims 16 through 20. New Claim 16 recites that the multi-tier data model insulates the given software applications from changes in the conceptual model. Claim 17 recites that the multi-tier data model is insulated from changes in the given software applications. Support for new Claims 16 and 17 can be found in the patent application as originally filed at least at page 7, lines 20 through 28. No new matter is added.

Claim 18 recites that the consolidated multi-tier data model provides an application independent and normalized data model where the composite class view is application independent. Support for Claim 18 can be found in the patent application as originally filed at page 11, lines 17 through 21.

Claim 19 recites that the multi-tier data model has an editor and a class store for the multi-tier data model with the class store providing an interface to the respective class views, the composite class view, and the conceptual model to share data between the multi-tier data model, and the given program applications. Claim 20 recites that this can be accomplished using XML. Support for these claims can be found at least at page 13, lines 15 through 26, page 10, lines 10 through 13, and page 8, lines 1 through 4 of the patent application as originally filed.

Entry and allowance of these new claims are respectfully requested. Applicants believe that these features are not taught or suggested by the cited references.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims (e.g., Claims 1 through 20) are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By 
Mary Lou Wakimura
Registration No. 31,804
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133

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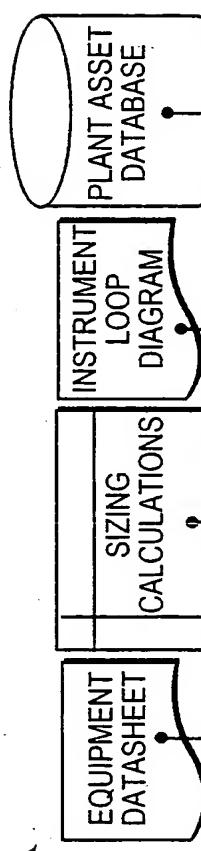
Appl'n No.: 10/692,006
Title: System and Method For ...
Inventors: Robert G. Noble, et al
Annotated Sheet

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INTERFACING ENGINEERING APPLICATIONS TO THE
THREE-TIER DATA MODEL ARCHITECTURE

ENGINEERING APPLICATIONS



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TIER I - CLASS VIEWS 20
TIER II - COMPOSITE CLASS VIEWS

TIER III - CONCEPTUAL SCHEMA

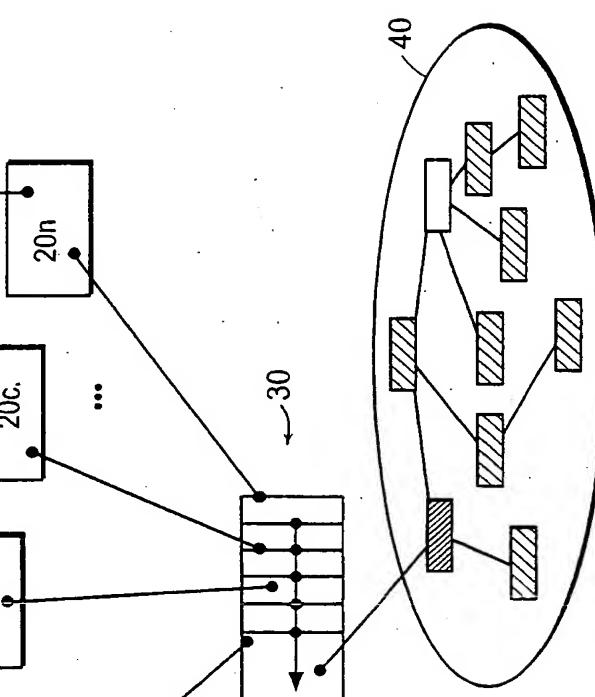


FIG. 1